TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

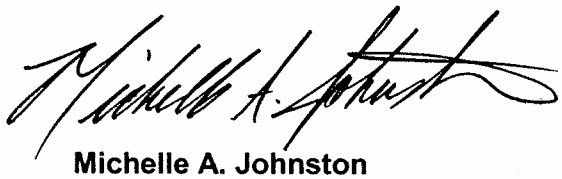
ANALYTICAL REPORT

Perfluorocarbon (PFC) Analysis

Lot #: D9K200621

Dena Haverland

Dalton Utilities
1200 V.D. Parrot Jr. Parkway
Dalton, GA 30721



Michelle A. Johnston
Project Manager

January 11, 2010

Case Narrative
D9K200621

TestAmerica Denver utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the methods summary page in accordance with the methods indicated. Dilution factors and footnotes are provided on each datasheet to assist in the interpretation of the results.

The results relate only to the samples in this report and meet all requirements of NELAC. All data have been reviewed for compliance with the laboratory QA/QC plan and have found to be compliant with laboratory protocols with any exceptions noted below.

Please note that Non-Detect (ND) results have been evaluated down to the Method Detection Limit (MDL) and should be considered ND at the MDL. Unless otherwise noted, results for solids have been dry weight corrected.

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Sample Arrival and Receipt

The following report contains the analytical results for one sample received at TestAmerica Denver on November 20, 2009, according to documented sample acceptance procedures. The sample was received in good condition at a temperature of 12.1°C.

The sample was received above the recommended temperature of 4 +/-2 degrees Celsius. The client was notified on November 23, 2009.

No other anomalies were encountered during sample receipt.

Standards

Analytical standards were prepared using commercially available certified solutions containing all compounds of interest.

The mass labeled compounds 13C4 PFBA, 13C2 PFHxA, 18O2 PFHxS, 13C4 PFOA, 13C4 PFOS, 13C5 PFNA, 13C2 PFDA, 13C2 PFUnA, 13C2 PFDoA, and D3 MeFOSA were introduced at the extraction step and were used for internal standards for the quantitation of the target compounds.

Sample Extraction and Analysis

The samples presented in this report were extracted for the target analytes by TestAmerica Denver's Standard Operating Procedure (SOP) DV-OP-0019 and analyzed for the target analytes by TestAmerica Denver's SOP DV-LC-0012.

Method QC Samples

The Method Blank is processed reagent water spiked with internal standard and prepared with each batch of 20 samples of the same matrix. The method blanks were non-detect at the reporting limits for the target analytes.

Each batch is prepared with low and mid level Laboratory Control Samples (LCS). The LCS recoveries for both levels were within established control limits, with the exception of the items noted in section Analytical Comments.

Analytical Comments

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high concentrations of target analytes, sample 11-19-09-01 had to be analyzed at a dilution. The reporting limits have been adjusted relative to the dilution required.

Due to a limitation in the LIMS system, the low-level LCS associated with QC batch 9331317 reported the percent recoveries for several PFCs as 0.0%. These compounds were recovered within the control limits, as outlined below.

Compound	Low-Level LCS Actual Recovery	Control Limits	Low-Level LCS Actual Result	MDL
PFPA	92%	50-150%	0.46055 ug/kg	0.882 ug/kg
PFHpA	93%	50-150%	0.46657 ug/kg	0.723 ug/kg
PFNA	98%	50-150%	0.48784 ug/kg	0.500 ug/kg
PFDA	79%	50-150%	0.39530 ug/kg	0.755 ug/kg
PFUnA	100%	50-150%	0.50182 ug/kg	1.81 ug/kg
PFDoA	87%	50-150%	0.43643 ug/kg	0.819 ug/kg
PFTriA	89%	50-150%	0.44514 ug/kg	1.15 ug/kg
PFTeA	84%	50-150%	0.41782 ug/kg	1.45 ug/kg
PFBS	72%	50-150%	0.36115 ug/kg	0.836 ug/kg
PFHxS	87%	50-150%	0.43589 ug/kg	0.773 ug/kg
PFOSA	95%	50-150%	0.368782 ug/kg	1.236 ug/kg

As the compounds were detected below the Method Detection Limits (MDL), the system reports the percent recoveries as 0.0%.

The laboratory generated MS/MSD associated with QC batch 9331317 exhibited spike compound recoveries, RPD data, and/or internal standard recoveries outside the QC control limits for several compounds. The acceptable low-level and mid-level LCS analyses data indicated the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

The Standard Operating Procedure (SOP) was altered slightly for these samples in the sample prep and LC conditions. The alterations are listed below.

Solvents are now the same as they were in the original SOP and run per the following gradient: From 0 to 11 minutes, the flow rate is 0.4 mL/minute and the MeOH ramps up from 25% to 100%. From 11 to 11.01 minutes, the flow rate increases to 0.7 mL/minute and this flow is diverted from the MS. At 13 minutes the flow rate decreases back down to 0.4 mL/minute and 25% MeOH. The column then equilibrates to 14 minutes.

PFTriA and PFTeA now use 13C2 PFUnA as their internal standard instead of 13C2 PFDoA.

No other anomalies were observed.

EXECUTIVE SUMMARY - Detection Highlights

D9K200621

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
11-19-09-01 11/19/09 10:23 001				
Perfluorooctanesulfonate	210	30	ug/kg	DEN -LC-0012
Perfluorooctanoic Acid	67 J	75	ug/kg	DEN -LC-0012
Perfluorobutanoic acid (PFBA)	8.8 J	15	ug/kg	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	10 J	15	ug/kg	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	14 J	15	ug/kg	DEN -LC-0012
Perfluoroheptanoic acid (PFHpA	14 J	15	ug/kg	DEN -LC-0012
Perfluorononanoic acid (PFNA)	28	15	ug/kg	DEN -LC-0012
Perfluorodecanoic acid (PFDA)	280	15	ug/kg	DEN -LC-0012
Perfluoroundecanoic acid (PFUn	130	37	ug/kg	DEN -LC-0012
Perfluorododecanoic acid (PFDo	100	37	ug/kg	DEN -LC-0012
Perfluorotridecanoic acid (PFT	42	37	ug/kg	DEN -LC-0012
Perfluorotetradecanoic acid (P	13 J	37	ug/kg	DEN -LC-0012
Perfluorobutane sulfonate (PFB	96	15	ug/kg	DEN -LC-0012
Perfluorooctane sulfonamide (F	270	37	ug/kg	DEN -LC-0012
Percent Moisture	33	0.10	%	ASTM D 2216-90

METHODS SUMMARY

D9K200621

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Method for Determination of Water Content of Soil	ASTM D 2216-90	ASTM D2216-90

References:

ASTM Annual Book Of ASTM Standards.

DEN Severn Trent Laboratores, Denver, Facility Standard Operating Procedure.

METHOD / ANALYST SUMMARY

D9K200621

ANALYTICAL METHOD	ANALYST	ANALYST ID
ASTM D 2216-90	Braden H. Peterson	6733
DEN -LC-0012	Jacqueline Bonnett	003601
DEN -LC-0012	Teresa L. Williams	002510

References:

ASTM Annual Book Of ASTM Standards.

DEN Severn Trent Laboratores, Denver, Facility Standard Operating Procedure.

SAMPLE SUMMARY

D9K200621

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
LPW43	001	11-19-09-01	11/19/09	10:23

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Dalton Utilities

Client Sample ID: 11-19-09-01

HPLC

Lot-Sample #...:	D9K200621-001	**Work Order #...:**	LPW431AA	**Matrix.....:**	SOLID
Date Sampled...:	11/19/09 10:23	**Date Received..:**	11/20/09		
Prep Date.....:	11/27/09	**Analysis Date..:**	12/05/09		
Prep Batch #...:	9331317	**Analysis Time..:**	15:29		
Dilution Factor:	10				
% Moisture.....:	33	**Method.....:**	DEN -LC-0012		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorooctanesulfonate	**210**	**30**	**ug/kg**	**5.6**
Perfluorooctanoic Acid	**67 J**	**75**	**ug/kg**	**15**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	116	(50 - 200)
13C4 PFOS	112	(50 - 200)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-19-09-01

HPLC

Lot-Sample #...:	D9K200621-001	Work Order #...:	LPW432AA	Matrix.....:	SOLID
Date Sampled...:	11/19/09 10:23	Date Received..:	11/20/09		
Prep Date.....:	11/27/09	Analysis Date..:	01/03/10		
Prep Batch #...:	9331317	Analysis Time..:	16:33		
Dilution Factor:	5				
% Moisture.....:	33	Method.....:	DEN -LC-0012		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorobutanoic acid (PFBA)	8.8 J	15	ug/kg	2.5
Perfluoropentanoic acid (PFPA)	10 J	15	ug/kg	6.6
Perfluorohexanoic acid (PFHxA)	14 J	15	ug/kg	1.5
Perfluoroheptanoic acid (PFHpA)	14 J	15	ug/kg	5.4
Perfluorononanoic acid (PFNA)	28	15	ug/kg	3.7
Perfluorodecanoic acid (PFDA)	280	15	ug/kg	5.7
Perfluoroundecanoic acid (PFUnA)	130	37	ug/kg	14
Perfluorododecanoic acid (PFDoA)	100	37	ug/kg	6.1
Perfluorotridecanoic acid (PFTriA)	42	37	ug/kg	8.6
Perfluorotetradecanoic acid (PFTeA)	13 J	37	ug/kg	11
Perfluorobutane sulfonate (PFBS)	96	15	ug/kg	6.3
Perfluorohexane sulfonate (PFHxS)	ND	15	ug/kg	5.8
Perfluorooctane sulfonamide (FOSA)	270	37	ug/kg	9.3

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
MeFOSA	97	(50 - 200)
13C4 PFOA	95	(50 - 200)
13C4 PFOS	92	(50 - 200)
13C4 PFBA	87	(50 - 200)
13C2 PFHxA	92	(50 - 200)
18O2 PFHxS	90	(50 - 200)
13C5 PFNA	97	(50 - 200)
13C2 PFDA	95	(50 - 200)
13C2 PFUnA	91	(50 - 200)
13C2 PFDoA	74	(50 - 200)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 11-19-09-01

General Chemistry

Lot-Sample #...: D9K200621-001 Work Order #...: LPW43 Matrix.....: SOLID
Date Sampled...: 11/19/09 10:23 Date Received..: 11/20/09
% Moisture.....: 33

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	33	0.10	%	ASTM D 2216-90	11/24/09	9328141

Dilution Factor: 1 Analysis Time..: 14:00 MDL.....: 0.0